

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-23. (Canceled)

24. (Original) A method of evaluating the effect of an agent on a biological condition, the method comprising:

(a) providing a first cell culture of cells of a first cell type and a second cell culture of cells of a second cell type in a microenvironment in which the cells of first and second cell cultures share a common medium, wherein the first and second cell types interact as part of the biological condition;

(b) exposing the cells of the microenvironment to the agent;

(c) imaging the first and second cell types after exposure to the agent; and

(d) quantitatively evaluating one or more images obtained in (c) to determine how the agent affects quantitative representations of phenotypes of the cells, thereby predicting the effect of the agent in treating the biological condition.

25. (Original) The method of claim 24, wherein quantitatively evaluating one or more images identifies at least one of a change in migration pattern, growth rate, endocytosis, cell shape, and extracellular matrix deposition of the cells of at least one of the first and second cell cultures.

26. (Original) The method of claim 24, wherein the agent is a drug candidate.

27. (Original) The method of claim 24, wherein the biological condition is a disease.

28. (Original) The method of claim 24, wherein the biological condition is normal unperturbed functioning of an organ or tissue and the agent causes one or more of the cell types to become abnormal.

29. (Original) The method of claim 24, wherein the common medium is a cell growth medium or a cell support medium.

30. (Original) The method of claim 24, wherein the microenvironment comprises:
a first compartment in which the first cell culture is grown, and
a second compartment in which the second cell culture is grown, and
wherein the common medium contacts the first and second compartments and the
first and second cell cultures.

31. (Original) A method of evaluating an agent's effect on a biological condition, the
method comprising:

- (a) exposing cells of a first cell type and cells of a second cell type to the agent,
wherein the first and second cell types interact in producing the biological condition;
- (b) imaging cells of the first and second cell types after exposure to the agent;
- (c) quantitatively evaluating images obtained in (b) to identify any effects of the
agent on quantitative representations of phenotypes of the cells of the first and second cell types;
and
- (d) based upon any effects identified at (c), predicting the agent's effect on the
biological condition.

32. (Original) The method of claim 31, wherein quantitatively evaluating one or more
images obtained in (b) to identify any effects of the agent comprises identifying changes in at
least one of the viability, the function, and the morphology of the cells of at least one of the first
and second cell types.

33. (Original) The method of claim 31, wherein quantitatively evaluating one or more
images identifies at least one of a change in migration pattern, growth rate, endocytosis, cell
shape, and extracellular matrix deposition of the cells of at least one of the first and second cell
cultures.

34. (Original) The method of claim 31, wherein the agent is a chemical compound or a
biological material

35. (Canceled).

36. (Original) The method of claim 31, wherein the biological condition is a disease.

37. (Original) The method of claim 36, wherein the biological condition is a cancer, Type I diabetes, Type II diabetes, a neurodegenerative disease, a cardiovascular disease, or an auto-immune disease.
38. (Original) The method of claim 31, wherein the biological condition is normal unperturbed functioning of an organ or tissue and the agent causes one or more of the cell types to become abnormal.
39. (Original) The method of claim 31, wherein the biological condition is a cancer, wherein the first cell type is a cancerous epithelial cell type and the second cell type is a mesenchymal cell type, and wherein the first and second cell types are from the same tissue or organ.
40. (Original) The method of claim 31, wherein the biological condition is a cancer, wherein the first cell type is a cancerous epithelial cell type and the second cell type is an endothelial cell type, and wherein the first and second cell types are from the same tissue or organ.
41. (Original) The method of claim 31, wherein the biological condition is a cancer and wherein the first cell type is a cancerous cell type and the second cell type is an immune system cell type.
42. (Original) The method of claim 31, wherein the biological condition is an auto-immune disease, and wherein the first cell type is an immune system cell type and the second cell type is a different cell type that is attacked by cells of the first cell type in the auto-immune disease.
43. (Original) The method of claim 31, wherein the biological condition is a neurodegenerative disease, and wherein the first cell type is a neuron cell type and the second cell type is a neuroglial cell type.
44. (Original) The method of claim 31, wherein the biological condition is Type II diabetes, and wherein the first cell type is a muscle cell type and the second cell type is an adipocyte cell type, an immune cell type, or a vascular cell type.

45. (Original) The method of claim 31, wherein the biological condition is cardiac disease, and wherein the first cell type is a cardiac myocyte and the second cell type is a stem cell, primary cell, fibroblast or endothelial cell of cardiac origin.